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Abstract of the national paper of Spain

I. The environment, natural resources and remote sensing

1. Earth observation by means of images received from artificial satellites is today a well-established means of generating reliable information on the Earth's resources and environment.
2. Spain's administrative, academic and scientific institutions have attained a high level of scientific and technical development and the necessary capabilities to ensure that the present role of remote sensing as a powerful tool in environmental management will be strengthened in the near future.
3. The ability to use multitemporal image data is opening up many possibilities for conducting dynamic ground studies and producing updates based on data comparison. Such data, captured at different dates, have helped to make possible the early detection of the onset of certain disasters and identification of the effects of acid rain, the monitoring of repopulation and the assessment and calculation of areas affected by forest fires.
4. Information transmitted by satellites is used for weather forecasting, atmospheric monitoring and predicting the effects of climate change on agriculture, forestry, fisheries and so on.

II. Navigation, location and positioning systems

5. Spain's authorities consider the project concerning the future global satellite navigation and positioning system to be of considerable strategic importance and regard its development as a priority. That view is based on the economic, industrial, technological, social (employment), security, defence and other benefits stemming from the development, implementation and operation of this type of system.
6. The Global Navigation Satellite System (GNSS) is scheduled for implementation in the year 2003. During the initial phase, known as the European Geostationary Navigation Overlay Service (EGNOS) (GNSS-1), it will be used in conjunction with the Global Positioning System (GPS) of the United States of America and the Russian Federation's Global Navigation Satellite System (GLONASS). Its establishment as a system for civilian use under European control will begin in the year 2010, this second phase being known as EUROSATNAV (GNSS-2).

7. Spain participates in the COSPAS-SARSAT search and rescue programme, the purpose of which is to help locate victims of accidents by the use of polar-orbiting satellites.

III. Review of space communications and applications

8. Spain's authorities have formulated and developed a policy of deregulation with regard to telecommunications, in line with European Union directives and in accordance with the basic telecommunications agreements of the World Trade Organization. As a result of that policy, the satellite communications market is now highly competitive, with standards comparable to those of the most advanced countries.
9. Satellite communications and applications in Spain have undergone significant developments, in particular owing to the Hispasat satellite telecommunications system. In addition, Spanish enterprises possess the technology and experience in the field to enable them to be highly competitive.
10. Moreover, the development and use of new technologies (research and development) have been fostered by the authorities, with the promotion and encouragement of specific activities in cooperation with the enterprises of the sector.

IV. Promotion and development of space research in Spain

11. Prominent among the main efforts undertaken in Spain in recent years are measures aimed at developing basic space science and related sciences. Not only have the economic resources invested in this area doubled, but the number of highly trained scientists in this sphere of activity has also increased fivefold. In addition, a system has been established that will ensure regular and continuous funding for the sector.
12. An examination of the three areas into which these basic space science activities are classified (space astrophysics, exploration of the solar system and research into microgravity conditions) will show the results of considerable efforts that have led to significant progress in Spain's participation in space research activities.
13. A further notable endeavour is the Research Personnel Training Plan, a national programme for the training of young researchers that has been in operation since 1987 and under which a group of technologists has undergone training in areas of major importance to the industry, in particular through a special scheme as part of an agreement established with the European Space Agency (ESA).

V. Economic and social benefits of space activity

14. Spain has regularly participated in space activities conducted in Europe through ESA and its predecessors since their beginnings in the 1960s. In 1974, it was the eleventh country to place a satellite in orbit, the Intasat. When the Ministry of Industry and Energy, through the Centre for the Development of Industrial Technology, assumed responsibility for administration and representation in the Agency in the 1980s, it decided to establish and build up an internationally competitive industrial sector. This, together with the creation of the National Space Research Programme, led to the development of a highly skilled Spanish industry with a strong presence in the commercial markets and a scientific community of acknowledged prestige. Under the National Space Research Programme it has been possible

to undertake a number of national initiatives, such as the Minisat programme, for the development, manufacture, integration, placing in orbit and operation of small satellites.

15. Spain, with its industry and the ESA frame of reference, has contributed to space developments that are of undoubted benefit to society. Satellites are today an essential tool for weather forecasting, direct television broadcasting, telecommunications, geographical positioning, air, sea and land traffic control, environmental protection and many other operations that are increasing in number and producing a broad economic and social impact.

16. At the same time, space technology requirements have encouraged the establishment of a multidisciplinary sector, whose development has subsequently given rise to a large number of applications and innovations in other industrial sectors, ranging from aeronautics and motor vehicles to household appliances and sports equipment.
